

Remarks

Claims 15, 23, 24, and 26-28 are now pending in this application. Applicants have amended claims 23, and 26-28, to clarify the present invention. Applicants respectfully request favorable reconsideration of this application.

The Examiner rejected claims 15, 23-25, and 28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 6,697,681 to Stoddard et al. in view of U.S. patent 6,522,949 to Ikeda et al. The Examiner rejected claims 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Stoddard et al. in view of Ikeda et al. and further in view of U.S. patent 6,587,749 to Matsumoto.

The combination of Stoddard et al. and Ikeda et al. does not suggest the present invention as recited in amended independent claims 23 or 28, since, among other things, Stoddard et al. does not suggest a control system for controlling movements of a plurality of manipulators that includes a main computer module and a physically separate drive for each manipulator, each drive module including a drive unit, a power supply and an axis computer. Along these lines, Figs. 2 and 3 illustrate embodiments of the claimed invention. As can be seen from Figs. 2 and 3, the claimed invention includes a main computer module 4 that is operatively connected to a plurality of drive modules, one for each robot 2. Contrary to the claimed invention, Stoddard et al. suggests a system includes a plurality of robots 40 and a plurality of controllers 30, one for each robot. Stoddard et al. suggests controlling each robot separately, whereas the claimed invention includes a main computer module that sends orders to each robot drive module.

Ikeda et al. also does not suggest a control system for controlling movements of a plurality of manipulators that includes a main computer module and a physically separate drive for each manipulator, each drive module including a drive unit, a power supply and an axis computer. Rather, Ikeda et al. appears to suggest a system that includes a single robot and a single controller. Accordingly, the combination of Stoddard et al. and Ikeda et al. does not suggest the claimed invention.

The combination of Stoddard et al., Ikeda et al. and Matsumoto does not suggest the invention recited in claims 26 or 27, which depend from claim 23, since, among other things, Matsumoto also does not suggest a control system for controlling movements of a plurality of manipulators that includes a main computer module and a physically separate drive for each manipulator, each drive module including a drive unit, a power supply and an axis computer. Rather, like Stoddard et al. and Ikeda et al., Matsumoto appears to suggest a system that includes a single robot and a single controller. Therefore, the combination of Stoddard et al., Ikeda et al. and Matsumoto does not suggest the present invention as recited in claims 26 or 27.

Advantages of the claimed invention include physically separate main computer and drive modules. This provides the claimed invention with increased flexibility as compared to traditional systems such as those suggested by Stoddard et al., Ikeda et al. and Matsumoto. For example, the claimed invention makes it easier to add another robot to a system. The communications network facilitates the addition or deletion of robots to the system. This eliminates the need to have an oversized and overpowered control system.

Additionally, each drive module including a power supply to power the robot that the drive module is associated with permits the claimed invention to avoid the need for bulky and expensive power cables between a robot control and the robot motors. This is accomplished by including physically separate main computer modules and drive modules, which are connected by a communications network. With only a communications network necessary to connect the main computer and drive modules, the main computer and drive modules may be separated by greater distances than if power cables were required to make the connections. The claimed invention makes it possible to locate drive modules within a robot workcell, close to the robot, thereby minimizing the amount of power cables necessary. A robot workcell is typically surrounded by a safety fence. The claimed invention also permits the main computer to be located outside of the robot workcell within reach of and easy access by the operator.

In view of the above, the references relied upon in the office action, whether considered alone or in combination, do not suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not make the claimed invention obvious. Accordingly, Applicants respectfully request withdrawal of the rejections based upon the cited references.

In conclusion, Applicants respectfully request favorable reconsideration of this case and early issuance of the Notice of Allowance.

If an interview would advance the prosecution of this case, Applicants urge the Examiner

to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

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Respectfully submitted,

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